Complete Summary

GUIDELINE TITLE

Preventing tetanus, diphtheria, and pertussis among adolescents: use of tetanus toxoid, reduced diphtheria toxoid and acellular pertussis vaccines. Recommendations of the Advisory Committee on Immunization Practices (ACIP).

BIBLIOGRAPHIC SOURCE(S)

Broder KR, Cortese MM, Iskander JK, Kretsinger K, Slade BA, Brown KH, Mijalski CM, Tiwari T, Weston EJ, Cohn AC, Srivastava PU, Moran JS, Schwartz B, Murphy TV. Preventing tetanus, diphtheria, and pertussis among adolescents: use of tetanus toxoid, reduced diphtheria toxoid and acellular pertussis vaccines recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR Recomm Rep 2006 Mar 24;55(RR-3):1-34. PubMed

GUIDELINE STATUS

This is the current release of the guideline.

* * REGULATORY ALERT * *

FDA WARNING/REGULATORY ALERT

Note from the National Guideline Clearinghouse: This guideline references a drug(s) for which important revised regulatory and/or warning information has been released.

On October 3, 2005, The U.S. Food and Drug Administration (FDA) and CDC notified consumers and health care providers of five reports of Guillain Barre Syndrome following administration of Meningococcal Conjugate Vaccine A, C, Y, and W135 (trade name Menactra), manufactured by Sanofi Pasteur. It is not known yet whether these cases were caused by the vaccine or are coincidental. FDA and CDC are sharing this information with the public now and actively investigating the situation because of its potentially serious nature. Guillain Barre Syndrome (GBS) is a serious neurological disorder that can occur, often in healthy individuals, either spontaneously or after certain infections. GBS typically causes increasing weakness in the legs and arms that can be severe and require hospitalization. Because of the potentially serious nature of this matter, FDA and CDC are asking any persons with knowledge of any possible cases of GBS occurring after Menactra to report them to the Vaccine Adverse Event Reporting System (VAERS) to help the agencies further evaluate the matter. See the FDA Web site for more information.

COMPLETE SUMMARY CONTENT

SCOPE

DISEASE/CONDITION(S)

Tetanus, diphtheria, and pertussis

GUIDELINE CATEGORY

Prevention

CLINICAL SPECIALTY

Family Practice
Infectious Diseases
Internal Medicine
Obstetrics and Gynecology
Pediatrics

INTENDED USERS

Physicians

GUIDELINE OBJECTIVE(S)

- To review tetanus, diphtheria, and pertussis vaccination policy in the United States, with emphasis on adolescents
- To describe the clinical features and epidemiology of pertussis among adolescents
- To summarize the immunogenicity, efficacy, and safety data of the two tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis (Tdap) vaccines licensed for use among adolescents
- To present recommendations for tetanus, diphtheria, and pertussis vaccination among adolescents aged 11-18 years

TARGET POPULATION

Adolescents aged 11-18 years

INTERVENTIONS AND PRACTICES CONSIDERED

1. Tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis vaccine (Tdap) (BOOSTRIX®; ADACEL™)
2. Tetanus and diphtheria toxoids vaccine (Td)
3. Tetravalent meningococcal conjugate vaccine ([MCV4] Menactra®)
4. Tetanus immune globulin (TIG)

MAJOR OUTCOMES CONSIDERED

Morbidity associated with tetanus, diphtheria, and pertussis

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

Not stated

NUMBER OF SOURCE DOCUMENTS

Not stated

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Not stated

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Not applicable

METHODS USED TO ANALYZE THE EVIDENCE

Review

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not stated

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

Not stated

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

COST ANALYSIS

The societal costs of pertussis are important, and universally vaccinating adolescents against pertussis is likely to be cost effective. In one study, the economic impact of pertussis among Massachusetts adolescents aged 10–17 years was evaluated using the state's enhanced pertussis surveillance system. The mean medical cost per adolescent case of pertussis was an estimated $201 and $256 for mild and severe cases of cough illness, respectively (in 2004 dollars), excluding the cost of providing antimicrobials to close contacts of the case-adolescents. The largest proportion of this cost was for medical office visits and antimicrobial therapy. When indirect, nonmedical costs (e.g., missed time from work for parents of adolescents) were included, total societal cost of an adolescent case of pertussis was $361 and $416 for mild and severe cough illness, respectively (in 2004 dollars).

Two U.S. economic studies have compared adolescent vaccination with other pertussis vaccination strategies. Both studies identified a single dose of tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis vaccine (Tdap) during adolescence as the most cost-effective strategy, under different assumptions about pertussis incidence, waning immunity, vaccine efficacy, vaccine coverage, and infant transmission. In the first study, a cost-benefit analysis was conducted to compare seven adolescent and/or adult pertussis vaccination strategies during a 10-year interval (2001-2010), using a single dose of a Tdap. In this analysis, the incidence of pertussis among adolescents and adults was estimated from prospective studies to be 450-507 cases per 100,000 population. Strategies included vaccinating all adolescents aged 10-19 years, vaccinating all persons aged $\geq$10 years (i.e., universal adolescent and adult vaccination), vaccinating adolescents and adults aged $\geq$15 years that were the primary care-takers of infants, and four other adult vaccination strategies. Among these strategies, vaccinating all adolescents was identified as the most cost-effective strategy. Universal adolescent Tdap vaccination was cost-saving to society when the Tdap vaccine and program costs were $\leq$$37 (2002 dollars) per adolescent vaccinated.

In a second study, six adolescent and/or adult Tdap vaccination strategies were compared by modeling health outcomes over the course of a lifetime for hypothetical cohort of 4 million adolescents. Incidence rates of pertussis among adolescents and adults were estimated from Massachusetts surveillance data; baseline estimates were 155 and 11 per 100,000 population for adolescents and adults, respectively. The six strategies included no adolescent or adult vaccination, one-time adolescent vaccination at age 11 years, one-time adult vaccination, adult vaccination with decennial Tdap boosters, adolescent and adult vaccination with decennial Tdap boosters, and postpartum vaccination. The study assumed an incremental increase in Tdap price of $15 compared with tetanus and

diphtheria toxoids vaccine (Td), with a Tdap vaccination cost of $25 per person vaccinated. Universal adolescent vaccination was the most cost-effective strategy. Vaccinating all adolescents once would cost $1,100 per pertussis case prevented or $20,000 per quality adjusted life year (QALY) saved, both in 2004 dollars. By contrast with the cost-benefit analysis, which estimated the incidence of pertussis in adolescents to be approximately 3 times higher, Tdap vaccination was not cost-saving under the second study's baseline assumptions. In a sensitivity analysis, results from the second study found that if the incidence of adolescent and adult pertussis was four times the base-case estimates, universal adolescent Tdap vaccination would be cost-saving to society.

METHOD OF GUIDELINE VALIDATION

Not stated

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

Not applicable

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

1. Routine Tetanus Toxoid, Reduced Diphtheria Toxoid, and Acellular Pertussis (Tdap) Vaccination

   1-A. Recommendations for Use (see Table titled "Summary of evidence for routine adolescent tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis (Tdap) vaccination," below)

   1. Adolescents aged 11-18 years should receive a single dose of Tdap instead of tetanus and diphtheria (Td) for booster immunization against tetanus, diphtheria, and pertussis if they have completed the recommended childhood diphtheria and tetanus toxoids and whole cell pertussis vaccine (DTP)/diphtheria and tetanus toxoids and acellular pertussis vaccine (DTaP) vaccination series* and have not received Td or Tdap. The preferred age for Tdap vaccination is 11-12 years; routinely administering Tdap to young adolescents will reduce the morbidity associated with pertussis in adolescents.
   2. Adolescents aged 11-18 years who received Td, but not Tdap, are encouraged to receive a single dose of Tdap to provide protection against pertussis if they have completed the recommended childhood DTP/DTaP vaccination series.* An interval of at least 5 years between Td and Tdap is encouraged to reduce the risk for local and systemic reactions after Tdap vaccination. However, an interval less than 5 years between Td and Tdap can be used. The benefit of using Tdap at a shorter interval to protect against pertussis generally outweighs the risk for local and systemic reactions after vaccination in settings with increased risk for pertussis or its complications (See "Pertussis Outbreaks and Other Settings with Increased Risk for Pertussis or its Complications" [section 3-C in this summary]).

3. Vaccine providers should administer Tdap and tetravalent meningococcal conjugate vaccine ([MCV4] Menactra®) (which both contain diphtheria toxoid) to adolescents aged 11-18 years during the same visit if both vaccines are indicated and available (Bilukha & Rosenstein, 2005; "Guillain-Barre syndrome," 2005).

   *Five doses of DTP/DTaP before seventh birthday; if the fourth dose was administered on or after the fourth birthday, the fifth dose is not needed.

Table. Summary of evidence for routine adolescent tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis vaccination*

1-A:1 Efficacy against and tetanus, diphtheria, and pertussis is supported by immunogenicity results of randomized, controlled clinical trials among adolescents; safety is supported by results of randomized, controlled clinical trials among adolescents.
1-A:2 Safety of an interval of at least 5 years between tetanus and diphtheria toxoids vaccine (Td) and Tdap is supported by randomized, controlled clinical trials, among adolescents.
1-A:3 Safety of simultaneous vaccination with Tdap and tetravalent meningococcal conjugate vaccine (MCV4) has not been directly studied, but is inferred from results of a randomized, controlled clinical trial among adolescents vaccinated with Td and MCV4.

* For details, see the following sections: "BOOSTRIX," "ADACEL," and "Safety Considerations for Adolescent Vaccination with Tdap or Td" in the original guideline document.

1-B. Dosage and Administration

The dose of Tdap is 0.5 mL, administered intramuscularly (IM), preferably into the deltoid muscle.

1-C. Simultaneous Vaccination with Tdap and Other Vaccines

If two or more vaccines are indicated, they should be administered during the same visit (i.e., simultaneous vaccination). Each vaccine should be administered using a separate syringe at a different anatomic site. Some experts recommend administering no more than two injections per muscle, separated by at least one inch.

Administering all indicated vaccines during a single visit increases the likelihood that adolescents will receive each of the vaccines on schedule (Atkinson et al., 2002). Vaccine providers should administer MCV4 and Tdap (or Td) during the same visit if both vaccines are indicated and available. MCV4 contains diphtheria toxoid as a carrier protein ("Meningococcal," 2005) (see "Safety Considerations for Adolescent Vaccination with Tdap or Td" in the original guideline document).

1-D. Interchangeable Use of Tdap Vaccines

A single dose of either Tdap product (BOOSTRIX® or ADACEL™) can be administered to adolescents regardless of the type or manufacturer of pediatric DTP/DTaP used for childhood vaccination.

1-E. Preventing Adverse Events

Syncope can occur after vaccination, might be more common among adolescents and young adults than among other age groups, and has rarely resulted in serious injury (Atkinson et al., 2002; Braun, Patriarca, & Ellenberg, 1997; Woo, Ball, & Braun, 2005). Certain experts suggest a 15- to 20-minute observation period following vaccination (Atkinson et al., 2002; American Academy of Pediatrics, 2003). If syncope occurs, patients should be observed until symptoms resolve.

The potential for administration errors involving tetanus toxoid-containing vaccines and other products is well documented (CDC, 2004; Graham et al., 1981; Institute for Safe Medication Practices, 2003). For example, Td and tetanus toxoid (TT) have been inadvertently administered instead of tuberculin purified protein derivative (PPD) (CDC, 2004). Attention to proper vaccination technique, including use of an appropriate needle length and standard routes of administration (i.e., intramuscularly for Tdap) might minimize the risk for adverse events (Atkinson et al., 2002). Adverse events associated with inadvertent vaccine administration can be reported to the Vaccine Adverse Event Reporting System (VAERS) (see "Reporting of Adverse Events after Vaccination" in this summary).

1-F. Record Keeping

Health-care providers who administer vaccines are required to keep permanent vaccination records of vaccines covered under the National Childhood Vaccine Injury Act in the vaccinee's medical record; the Advisory Committee on Immunization Practices (ACIP) has recommended that this practice include all vaccines (Atkinson et al., 2002). Because documentation of tetanus toxoid–containing vaccine administration is frequently required for school or camp entry and as part of wound management, encouraging adolescents to maintain a personal vaccination record is important to minimize administration of unnecessary vaccinations. Vaccine providers can record the type of the vaccine, manufacturer, anatomic site, route, and date of administration and name of the administering facility on the personal record.

2. Contraindications and Precautions for Use of Tdap and Td Among Adolescents Aged 11-18 Years

2-A. Contraindications

- Tdap or Td is contraindicated for persons with a history of serious allergic reaction (i.e., anaphylaxis) to any component of the vaccine. Because of the importance of tetanus vaccination, persons with a

history of anaphylaxis to components included in all Tdap and Td vaccines should be referred to an allergist to determine whether they have a specific allergy to tetanus toxoid, can be desensitized to tetanus toxoid, and can safely receive TT vaccinations.
- Tdap is contraindicated for adolescents with a history of encephalopathy (e.g., coma or prolonged seizures) not attributable to an identifiable cause within 7 days of administration of a vaccine with pertussis components. This contraindication is for the pertussis components and these persons should receive Td instead of Tdap.

2-B. Precautions and Reasons to Defer Tdap and/or Td

A precaution is a condition in a vaccine recipient that might increase the risk for a serious reaction (Atkinson et al., 2002). The following are precautions for Tdap and/or Td. In these situations, vaccine providers should evaluate the risks for and benefits of administering Tdap or Td.

- Guillain-Barré syndrome $\leq$6 weeks after a previous dose of a tetanus toxoid-containing vaccine. If a decision is made to continue vaccination with tetanus toxoid, Tdap is preferred to Td if otherwise indicated.
- Progressive neurologic disorder, including progressive encephalopathy, or uncontrolled epilepsy, until the condition has stabilized. These precautions are for pertussis components.* If a decision is made to provide protection against pertussis, Tdap is preferred if otherwise indicated. If a decision is made to withhold pertussis vaccination, Td can be used instead of Tdap.

* These conditions are precautions for use of Tdap among adolescents but are contraindicated for use of pediatric DTaP among infants and children.

Tdap or Td vaccination should generally be deferred during the following situations.

- Moderate or severe acute illness with or without fever. Defer Tdap or Td vaccination until the acute illness resolves.
- History of an Arthus reaction following a previous dose of a tetanus toxoid-containing and/or diphtheria toxoid-containing vaccine, including MCV4 (see "Safety Considerations for Adolescent Vaccination with Tdap or Td" section in the original guideline document for a description of an Arthus reaction). Vaccine providers should carefully review the medical history to verify the diagnosis of an Arthus reaction, and can consult with an allergist or immunologist. If an Arthus reaction was likely, vaccine providers should consider deferring Tdap or Td vaccination until at least 10 years have elapsed since the last tetanus toxoid-containing and/or diphtheria toxoid-containing vaccine was received. If the Arthus reaction was associated with a vaccine that contained diphtheria toxoid without tetanus toxoid (e.g., MCV4), deferring Tdap or Td might leave the adolescent inadequately protected against tetanus. In this situation, if the last tetanus toxoid-containing vaccine was $\geq$10 years earlier, vaccine providers can obtain a serum antitetanus level to evaluate the need for tetanus vaccination

(antitetanus levels ≥0.1 IU/mL are considered protective) or administer TT.

2-C. Not Contraindications or Precautions

The following conditions are not contraindications or precautions for Tdap or Td, and adolescents with these conditions can receive a dose of Tdap or Td if otherwise indicated. The conditions in italics are precautions for pediatric DTP/DTaP but are not contraindications or precautions for Tdap vaccination in adolescents ("Pertussis vaccination," 1997).

- Temperature >105 degrees F (>40.5 degrees C) within 48 hours after pediatric DTP/DTaP not attributable to another cause
- Collapse or shock-like state (hypotonic hyporesponsive episode) within 48 hours after pediatric DTP/DTaP
- Persistent crying lasting >3 hours, occurring within 48 hours after pediatric DTP/DTaP
- Convulsions with or without fever, occurring within 3 days after pediatric DTP/DTaP
- History of an extensive limb swelling reaction following pediatric DTP/DTaP or Td that was not an Arthus reaction (see "Safety Considerations for Adolescent Vaccination with Tdap or Td" section in the original guideline document for descriptions of extensive limb swelling [ELS] and Arthus reactions)
- Stable neurologic disorder including well-controlled seizures, a history of seizure disorder that has resolved, and cerebral palsy
- Brachial neuritis
- Latex allergies other than anaphylactic allergies (e.g., a history of contact allergy to latex gloves) (Russell et al., 2004). The tip and rubber plunger of the BOOSTRIX® needleless syringe contain latex. The BOOSTRIX® single dose vial and ADACEL™ preparations contain no latex. Some Td products contain latex (consult package inserts for details).
- Breastfeeding
- Immunosuppression, including persons with human immunodeficiency virus (HIV). The immunogenicity of Tdap in persons with immunosuppression has not been studied and could be suboptimal.
- Intercurrent minor illness
- Use of antimicrobials

3. Special Situations for Use of Tdap and Td

3-A. General Principles

This section addresses special situations for Tdap and Td use. As with the routine situations, only a single dose of Tdap should be administered to an adolescent aged 11-18 years. For most, but not all, of the special situations, Tdap is preferred to Td. In some special situations or when contraindications or precautions are present, Td rather than Tdap might be indicated. The dose of Td is 0.5 mL, administered intramuscularly.

Tdap (or Td) and MCV4 should be administered at the same visit during special situations if both vaccines are indicated and available, although this might not always be feasible (e.g., wound management). Simultaneous administration of Tdap (or Td) and MCV4 and an interval of at least 5 years between Td and Tdap can reduce the risk for local and systemic reactions. In certain special situations listed below, the benefit of protection against disease probably outweighs this risk.

3-B. Nonsimultaneous Vaccination with Tdap and Other Vaccines, Including MCV4

ACIP has recommended that inactivated vaccines can be administered at any time before or after a different inactivated or live vaccine (i.e., nonsimultaneous vaccination), unless a contraindication exists (Atkinson et al., 2002). Simultaneous administration of Tdap (or Td) and MCV4 (which all contain diphtheria toxoid) during the same visit is preferred when both Tdap (or Td) and MCV4 are indicated. If simultaneous vaccination is not feasible (e.g., a vaccine is not available), MCV4 and Tdap (or Td) can be administered using any sequence. Persons who recently received one diphtheria toxoid-containing vaccine might have increased rates of adverse reactions after a subsequent diphtheria toxoid-containing vaccine when diphtheria antibody titers remain elevated from the previous vaccination (Lloyd et al., 2003; Edsall et al., 1967; Relyveld, Bizzini, & Gupta, 1998; James, Longshore, & Hendry, 1951) (see "Safety Considerations for Adolescent Vaccination with Tdap or Td" section in the original guideline document for a discussion of nonsimultaneous vaccination).

3-C. Pertussis Outbreaks and Other Settings with Increased Risk for Pertussis or its Complications

Vaccine providers can administer Tdap to adolescents aged 11-18 years at an interval less than 5 years after Td, particularly when the benefit of providing protection against pertussis is likely to be increased. The safety of an interval as short as approximately 2 years between Td and Tdap is supported by a Canadian study among children and adolescents (see "Spacing and Sequence Administration of Vaccines Containing Tetanus Toxoid, Diphtheria Toxoid, and Pertussis Antigens" in the original guideline document) (Halperin, et al., 2006).

The benefit of using Tdap at an interval less than 5 years after Td is likely to be increased among adolescents when the adolescent is at increased risk for acquiring pertussis (e.g., during outbreaks or periods of increased pertussis activity in the community). Postexposure chemoprophylaxis and other pertussis control guidelines are described elsewhere (CDC, 2000; American Academy of Pediatrics, 2003; Tiwari, Murphy, & Moran, 2005). The benefit of using a shorter interval also might be increased for adolescents with severe underlying medical conditions (e.g., chronic pulmonary disease or neurologic disorders), because these adolescents might be at increased risk for pertussis-related complications.

Infants aged <12 months are at highest risk for pertussis-related complications and hospitalizations compared with older age groups; young

infants have the highest risk for death from pertussis. Administering Tdap at an interval less than 5 years after Td to an adolescent who has or anticipates having close contact with an infant aged <12 months might reduce the risk for transmitting pertussis to the infant. Infants should be vaccinated on time with pediatric DTaP ("Pertussis vaccination," 1997; CDC, 2006).

3-D. Lack of Availability of Tdap or MCV4

If Tdap and MCV4 are both indicated but only one vaccine is available, the available vaccine generally should be administered. When Tdap is indicated but not available, vaccine providers should administer Td or temporarily defer Tdap/Td vaccination. Td should be administered to provide protection against tetanus and diphtheria if the adolescent received the last pediatric DTP/DTaP/DT or Td ≥10 years earlier. Recommendations for use of Tdap among adolescents who already received Td would apply to these adolescents when Tdap becomes available (see "Routine Tdap Vaccination" [section 1-A in this summary]). Tdap/Td vaccination can be deferred temporarily if the adolescent completed the childhood DTP/DTaP vaccination series*, received the last pediatric DTP/DTaP/DT or Td <10 years earlier, and is likely to return for follow-up. If the vaccine provider defers Td in order to administer Tdap when it becomes available, a system to recall the adolescent should be maintained. The adolescent also can be referred to another facility for Tdap administration.

* Five doses of DTP/DTaP before seventh birthday; if the fourth dose was administered on or after the fourth birthday, the fifth dose is not needed.

3-E. Tetanus Prophylaxis in Wound Management

ACIP has recommended administering tetanus toxoid-containing vaccine and tetanus immune globulin (TIG) as part of standard wound management to prevent tetanus (see Table titled "Guide to tetanus prophylaxis in routine wound management among adolescents aged 11-18 years," below) ("Diphtheria, tetanus, and pertussis," 1991). Tdap is preferred to Td for adolescents aged 11-18 years who were vaccinated against tetanus ≥5 years earlier, require a tetanus toxoid-containing vaccine as part of wound management, and have not previously received Tdap. Adolescents who have completed the 3-dose primary tetanus vaccination series and have received a tetanus toxoid-containing vaccine <5 years earlier are protected against tetanus and do not require a tetanus toxoid-containing vaccine as part of wound management. Although MCV4 and Tdap (or Td) should be administered at the same visit during routine situations if both vaccines are indicated, this might not be feasible for wound management.

A thorough attempt must be made to determine whether an adolescent has completed the 3-dose primary tetanus vaccination series. Persons with unknown or uncertain tetanus vaccination histories should be considered to have had no previous doses of a tetanus toxoid-containing vaccine (see "Adolescents with History of Incomplete Pediatric DTP/DTaP/DT or Td Vaccination" [section 3-H] in this summary). Persons who have not completed the primary series might require a tetanus toxoid-containing vaccine and passive immunization with TIG at the time of wound management (see Table

titled "Guide to tetanus prophylaxis in routine wound management among adolescents aged 11-18 years," below). When both TIG and a tetanus toxoid-containing vaccine are indicated, each product should be administered using a separate syringe at different anatomic sites ("Diphtheria, tetanus, and pertussis," 1991).

Adolescents with a history of an Arthus reaction after a previous dose of a tetanus toxoid-containing vaccine should not receive a tetanus toxoid-containing vaccine until ≥10 years after the most recent dose, even if they have a wound that is neither clean nor minor. If the Arthus reaction was associated with a vaccine that contained diphtheria toxoid without tetanus toxoid (e.g., MCV4), deferring Tdap or Td might leave the adolescent inadequately protected against tetanus and TT should be administered. In all circumstances, the decision to administer TIG is based on the primary vaccination history for tetanus.

Table. Guide to tetanus prophylaxis in routine wound management among adolescents aged 11-18 years

	Clean, minor wound		All other wounds[1]	
History of adsorbed tetanus toxoid (doses)	Tdap or Td[2]	TIG	Tdap or Td[2]	TIG
Unknown or <3	Yes	No	Yes	Yes
≥3	No[3]	No	No[4]	No

[1] Such as, but not limited to, wounds contaminated with dirt, feces, soil, and saliva; puncture wounds; avulsions; and wounds resulting from missiles, crushing, burrs, and frostbite
[2] Tdap is preferred to Td for adolescents who have never received Tdap. Td is preferred to TT for adolescents who received Tdap previously or when Tdap is not available (if TT and TIG are both used, Tetanus Toxoid Adsorbed rather than Tetanus Toxoid for Booster Use Only [fluid vaccine] should be used).
[3] Yes, if ≥10 years since the last tetanus toxoid-containing vaccine dose
[4] Yes, if ≥5 years since the last tetanus toxoid-containing vaccine dose (see original guideline document for discussion of Arthus reactions)

3-F. History of Pertussis

Adolescents aged 11-18 years who have a history of pertussis generally should receive Tdap according to the routine recommendations. This practice is preferred because duration of protection induced by pertussis is unknown (waning immunity might begin as early as 7 years after infection) and because the diagnosis of pertussis can be difficult to confirm, particularly with test results other than positive culture for Bordetella pertussis (Wendelboe et al., 2005). Administering pertussis vaccines to persons with a history of pertussis presents no theoretical safety concern.

3-G. Adolescents with History of Incomplete Pertussis Vaccination (Received Pediatric DT or Td Instead of Pediatric DTP/DTaP)

Adolescents who received pediatric DT or Td vaccination instead of one or more doses of pediatric DTP/DTaP in the series during childhood should generally receive a single dose of Tdap to provide protection against pertussis

if they completed the recommended childhood vaccination series for tetanus and diphtheria* and have no contraindications to the pertussis components. In routine situations, an interval of at least 5 years between Td and Tdap is encouraged (see "Routine Tdap Vaccination" [section 1-A in this summary]).

*Five doses of pediatric DTP/DTaP/DT before the seventh birthday; if the fourth dose was administered on or after the fourth birthday, the fifth dose is not needed. Children who began the tetanus and diphtheria vaccination series at age ≥7 years required 3 doses of Td to complete the primary series.

3-H. Adolescents with History of Incomplete Pediatric DTP/DTaP/DT or Td Vaccination

Adolescents aged 11-18 years who have never been vaccinated against tetanus, diphtheria, or pertussis (no doses of pediatric DTP/DTaP/DT or Td) should receive a series of three tetanus and diphtheria toxoid-containing vaccinations. The preferred schedule is a single Tdap dose, followed by a dose of Td ≥4 weeks after the Tdap dose, and a second dose of Td 6-12 months after the earlier Td dose. Tdap can be substituted for any one of the three Td doses in the series.

Adolescents who received other incomplete vaccination schedules for tetanus and diphtheria should be vaccinated with Tdap and/or Td according to guidance for catch-up vaccination. A single dose of Tdap can be used to substitute for any one of the Td doses in the series.

In situations in which the adolescent probably has received vaccination against tetanus and diphtheria but cannot produce records, vaccine providers can obtain serologic testing for antibodies to tetanus and diphtheria to avoid unnecessary vaccination. If antitetanus and antidiphtheria levels are each ≥0.1 IU/mL, previous vaccination with tetanus and diphtheria toxoid--containing vaccines is likely and a single dose of Tdap is indicated; this Tdap dose counts as the adolescent booster dose.

3-I. Children Aged 7-10 Years with Incomplete Pediatric DTP/DTaP Vaccination History

Neither Tdap vaccine is licensed for use in children aged <10 years (Food and Drug Administration [FDA], 2006, 2005). Children aged 7-10 years who never received a pediatric DTP/DTaP/DT dose or a Td dose generally should receive 3 doses of Td*; dose 2 is administered ≥4 weeks after dose 1 and dose 3 is administered 6-12 months after dose 2. Children aged 7-10 years who received other incomplete vaccination schedules against tetanus, diphtheria, and pertussis should be vaccinated according to catch-up guidance. When these children become adolescents (aged 11-18 years), they should receive Tdap according to the routine recommendations and interval guidance used for adolescents who completed the childhood DTP/DTaP series (see "Routine Tdap Vaccination" [section 1-A in this summary]).

* A single dose of BOOSTRIX® Tdap is licensed for persons aged 10 years and can be used instead of Td for one of the doses in children aged 10 years;

if BOOSTRIX® is administered early to a child aged 10 years, the dose counts as the adolescent Tdap dose usually administered at age 11-12 years.

In situations in which the child probably has received vaccination against tetanus and diphtheria but cannot produce records, vaccine providers can obtain serologic testing for antibodies to tetanus and diphtheria to avoid unnecessary vaccination. If antitetanus and antidiphtheria levels are each $\geq$0.1 IU/mL, previous vaccination with tetanus and diphtheria toxoid-containing vaccines is likely. In this situation, Td vaccination can be deferred until the child is aged 11-12 years and eligible to receive Tdap.

3-J. Inadvertent Administration of Tdap or Pediatric DTaP

To help prevent inadvertent administration of Tdap when pediatric DTaP is indicated or pediatric DTaP when Tdap is indicated, vaccine providers should review product labels before administering these vaccines; the packaging might appear similar. Tdap is not indicated for children aged <10 years. Tdap contains lower amounts of diphtheria toxoid and lower amounts of some pertussis antigens compared with pediatric DTaP. Studies of the immune responses to Tdap among infants have not been conducted. Pediatric DTaP is not indicated for persons aged $\geq$7 years; the increased diphtheria toxoid content is associated with higher rates of adverse reactions in older persons ("Diphtheria, tetanus, and pertussis," 1991; Ipsen, 1954; Lloyd et al., 2003; Macko & Powell, 1985; Rennels et al., 2000).

Guidance on the best approach to vaccination following inadvertent administration of Tdap or pediatric DTaP is based primarily on expert opinion. The family should be informed of any inadvertent vaccine administration. Adverse events associated with inadvertent vaccine administration can be reported to VAERS (see "Reporting of Adverse Events after Vaccination" in this summary). If Tdap is inadvertently administered instead of pediatric DTaP to a child aged <7 years as any one of the first three doses of the tetanus-diphtheria-pertussis vaccination series, the Tdap dose should not be counted as valid, and a replacement dose of pediatric DTaP should be administered. If the inadvertent administration is discovered while the child is in the office, the pediatric DTaP can be administered during the same visit. If the child has left the office, some experts suggest administering the replacement dose of pediatric DTaP within approximately 72 hours, or administering it 4 weeks later to optimize the child's immune response to the antigens in pediatric DTaP. This practice helps ensure that the child stays on the primary series schedule and has adequate protection against diphtheria and pertussis. However, the replacement dose of pediatric DTaP can be administered as soon as feasible at any interval after the inadvertent Tdap dose. The remaining doses of the pediatric DTaP series should be administered on the routine schedule, with at least a 4 week interval between the replacement dose of pediatric DTaP and the next dose of pediatric DTaP. For example, if an 8-week-old infant inadvertently received a dose of Tdap instead of the first dose of pediatric DTaP and does not receive a replacement dose of pediatric DTaP within about 72 hours, a replacement dose of pediatric DTaP can be administered 4 weeks after the inadvertent Tdap dose (age 12 weeks). The routine schedule of pediatric DTaP can then be resumed 4 weeks after the

pediatric DTaP replacement dose (age 16 weeks) with the other recommended vaccines ("Pertussis vaccination," 1997; CDC, 2006).

If Tdap is inadvertently administered as the fourth or the fifth dose in the tetanus-diphtheria-pertussis vaccination series to a child aged <7 years, the Tdap dose should be counted as valid and does not need to be repeated; the child who received Tdap as a fourth dose should complete the pediatric DTaP schedule (CDC, 2006). The routine adolescent Tdap vaccination recommendations would apply when this child becomes an adolescent. For example, a child who inadvertently receives Tdap at age 5 years instead of the fifth dose of pediatric DTaP should receive a second dose of Tdap at age 11-12 years.

If Tdap or pediatric DTaP is inadvertently administered to a child aged 7-9 years instead of Td as part of catch-up vaccination or for wound management, this dose can be counted as the adolescent Tdap dose, or the child can later receive an adolescent booster dose of Tdap according to the interval guidance used for Td to Tdap (see "Routine Tdap Vaccination" [section 1-A in this summary] and "Pertussis Outbreaks and Other Settings with Increased Risk for Pertussis or its Complications" [section 3-C in this summary]). In either case, the child should receive a dose of vaccine containing tetanus and diphtheria toxoids no longer than 10 years after the inadvertent Tdap or pediatric DTaP dose or according to the guidance for catch-up vaccination (see Table titled "Guide to catch-up vaccination with Td for children aged 7-10 years," below).

If pediatric DTaP is inadvertently administered to an adolescent aged 11-18 years, the dose should be counted as the adolescent Tdap booster. The adolescent should receive the next dose of a vaccine containing tetanus and diphtheria toxoids 10 years after the inadvertent pediatric DTaP dose or according to the guidance for catch-up vaccination (see Table titled "Guide to catch-up vaccination with Td and Tdap for adolescents aged 11-18 years," below).

Table. Guide to catch-up vaccination with Td for children aged 7-10 years[1]

Vaccination history before catch-up: number of pediatric DTP/DTaP/DT or Td doses administered before age 7 years			Minimum interval between doses of tetanus and diphtheria toxoid-containing vaccines[1,2]			
No. doses at age <1 year	No. doses at age 1-6 years	No. of Td/ doses needed to catch-up[1,2]	Last pediatric DTP/DTaP/DT dose to Td dose 1 at age ≥7 years	Td dose 1 to Td dose 2	Td dose 2 to Td dose 3	Td dose 3 to Td dose 4
Unknown	Unknown	3	NA[3]	4 weeks	6 months	--[4]

Vaccination history before catch-up: number of pediatric DTP/DTaP/DT or Td doses administered before age 7 years			Minimum interval between doses of tetanus and diphtheria toxoid-containing vaccines[1,2]			
No. doses at age <1 year	No. doses at age 1-6 years	No. of Td/ doses needed to catch-up[1,2]	Last pediatric DTP/DTaP/DT dose to Td dose 1 at age ≥7 years	Td dose 1 to Td dose 2	Td dose 2 to Td dose 3	Td dose 3 to Td dose 4
0	0	3	NA	4 weeks	6 months	--[4]
0	1	2	4 weeks	6 months	--[4]	NA
0	2	1	6 months	--[4]	NA	NA
0	3	0	--[4,5]	NA	NA	NA
1	0	3	NA: administer now	4 weeks	6 months	--[4]
1	1	2	4 weeks	6 months	--[4]	NA
1	2	1	6 months	--[4]	NA	NA
1	3	0	--[4,5]	NA	NA	NA
2	0	2	NA: administer now	6 months	--[4]	NA
2	1	1	6 months	--[4]	NA	NA
2	2	0	--[4,5]	NA	NA	NA
3	0	1	NA: administer now	--[4]	NA	NA
3	1	0	--[4,5]	NA	NA	NA

[1] Td is recommended for children aged 7-10 years; a single dose of BOOSTRIX® Tdap vaccine is licensed for persons aged 10 years and can be used instead of Td for one of the doses in children aged 10 years. If BOOSTRIX® is administered to a child aged 10 years, the dose counts as the adolescent Tdap dose. Pediatric DTP/DTaP/TD vaccines are not indicated for persons aged ≥7 years. See Appendix F in the original guideline document for a complete list of vaccine abbreviations.
[2] Number of doses and the minimum intervals between the last dose administered and the next dose of tetanus and diphtheria toxoid-containing vaccine needed to provide protection against tetanus and diphtheria.
[3] Not applicable.
[4] These children should receive Tdap to provide protection against tetanus, diphtheria, and pertussis according to the routine vaccination recommendations for adolescents who completed the pediatric DTP/DTaP series, when they become adolescents aged 11-18 years; an interval of at least 5 years between Td and Tdap is encouraged, but shorter intervals can be used (see "Routine Tdap Vaccination" [1-A] in this summary).
[5] Some experts suggest administering a dose of Td now to children aged 7-10 years with this vaccination history if no dose of a tetanus and diphtheria toxoid-containing vaccine was administered at age ≥4.

Table. Guide to catch-up vaccination with Td and Tdap for adolescents aged 11-18 years[1]

Vaccination history before catch-up: number of pediatric DTP/DTaP/DT or Td doses administered before age 11 years			Minimum interval between doses of tetanus and diphtheria toxoid-containing vaccines[1,2]			
No. doses at age <1 year	No. doses at age 1-10 years	No. of Td/Tdap doses needed to catch-up[1,2]	Last dose administered at age <11 years to adolescent dose 1	Adolescent dose 1 to dose 2	Adolescent dose 2 to dose 3	Adolescent dose 3 to dose 4
Unknown	Unknown	3	NA[3]	4 weeks	6 months	--[4]
0	0	3	NA	4 weeks	6 months	--[4]
0	1	2	4 weeks	6 months	--[4]	NA
0	2	1	6 months	--[4]	NA	NA
0	3	0	--[4,5]	NA	NA	NA
1	0	3	NA: administer now	4 weeks	6 months	--[4]
1	1	2	4 weeks	6 months	--[4]	NA
1	2	1	6 months	--[4]	NA	NA
1	3	0	--[4,5]	NA	NA	NA
2	0	2	NA: administer now	6 months	--[4]	NA
2	1	1	6 months	--[4]	NA	NA
2	2	0	--[4,5]	NA	NA	NA
3	0	1	NA: administer now	--[4]	NA	NA
3	1	0	--[4,5]	NA	NA	NA

[1] Adolescents aged 11-18 years with incomplete vaccination schedules for tetanus and diphtheria should receive a single dose of Tdap as part of catch-up vaccination if they have not received Tdap to add protection against pertussis; Td should be used for other doses if indicated (see "Routine Tdap Vaccination" [1-A] in this summary). Pediatric DTaP/DTP/DT vaccines are not indicated for persons aged ≥7 years. See Appendix F in the original guideline document for a complete list of vaccine abbreviations.

[2] Number of doses and the minimum intervals between the last dose administered and the next dose of tetanus and diphtheria toxoid-containing vaccine needed to provide protection against tetanus and diphtheria.

[3] Not applicable.

[4] To maintain protection against tetanus and diphtheria, a tetanus and diphtheria toxoid-containing vaccine is indicated 10 years after the last adolescent dose.

[5] If the adolescent has not received Tdap as one of the doses, a single dose of Tdap is encouraged to add protection against pertussis; an interval of at least 5 years between Td and Tdap is encouraged but shorter intervals can be used (see "Routine Tdap Vaccination" [1-A] in this summary).

3-K. Vaccination during Pregnancy

As with other inactivated vaccines and toxoids (Atkinson et al., 2002; CDC, "Guidelines for vaccinating pregnant women," 2005), pregnancy is not considered a contraindication for Tdap vaccination. Guidance on the use of Tdap during pregnancy to protect against pertussis is under consideration by ACIP. Pregnant adolescents who received the last tetanus toxoid-containing vaccine <10 years previously should generally receive Tdap after delivery, if otherwise indicated (see "Post-Partum Vaccination" [section 3-L] in this summary).

To prevent neonatal tetanus, pregnant adolescents who received the last tetanus toxoid-containing vaccine ≥10 years previously should generally receive Td in preference to Tdap. ACIP has recommended that pregnant women receive Td if the last tetanus toxoid-containing vaccine was administered ≥10 years previously ("Diphtheria, tetanus, and pertussis," 1991; CDC, "Recommended adult immunization schedule, 2005; Atkinson et al., 2002; CDC, "Guidelines for vaccinating pregnant women," 2005). If Td is indicated, vaccinating during the second or third trimester is preferred when feasible to minimize a perception of an association of vaccine with adverse pregnancy outcomes, which are more common during the first trimester. A pregnant adolescent who has not received the 3-dose primary tetanus vaccination series should begin this series during pregnancy, using Td. (see "Adolescents with History of Incomplete Pediatric DTP/DTaP/DT or Td Vaccination" [section 3-H] in this summary).

Because of lack of data on the use of Tdap in pregnant women, both Tdap manufacturers have established pregnancy registries. Health-care providers are encouraged to report Tdap vaccination during pregnancy to the following registries: BOOSTRIX® to GlaxoSmithKline Biologicals at 1-888-825-5249 and ADACEL™ to sanofi pasteur at 1-800-822-2463 (1-800-VACCINE) (FDA, 2006; FDA, 2005).

3-L. Post-Partum Vaccination

Adolescents aged 11-18 years, including those who are breastfeeding, should receive a single dose of Tdap as soon as feasible in the postpartum period, according to the routine Tdap recommendations and interval guidance (see "Routine Tdap Vaccination" [section 1-A] in this summary and "Pertussis Outbreaks and Other Settings with Increased Risk for Pertussis or its Complications" [section 3-C] in this summary). For adolescent mothers who have not already received Tdap, vaccinating the mother with Tdap during the postpartum period might reduce the risk for pertussis transmission to the infant. Protection of the mother against pertussis requires an estimated 1 to 2 weeks after vaccination.

3-M. Older Adolescents and Adults Aged >18 Years

To maintain protection against tetanus and diphtheria, ACIP has recommended decennial Td boosters for adults beginning 10 years after the adolescent dose ("Diphtheria, tetanus, and pertussis," 1991; "Immunization of adolescents," 1996). The safety and efficacy of Tdap (ADACEL™) as a

single dose booster immunization against tetanus, diphtheria, and pertussis has been demonstrated for persons aged 19-64 years (FDA, 2006). In October 2005, ACIP recommended a single dose of Tdap (ADACEL™) for adults aged 19-64 years who have not received Tdap; recommendations for the use of Tdap among adults will be published separately.****

**** Provisional ACIP recommendations are available at http://www.cdc.gov/nip/recs/provisional_recs/default.htm; final ACIP recommendations are available at http://www.cdc.gov/nip/publications/acip-list.htm.

Reporting of Adverse Events After Vaccination

As with any newly licensed vaccine, surveillance for rare adverse events associated with administration of Tdap is important for assessing its safety in large-scale use. The National Childhood Vaccine Injury Act of 1986 requires health-care providers to report specific adverse events that follow tetanus, diphtheria, or pertussis vaccination (http://vaers.hhs.gov/reportable.htm). All clinically significant adverse events should be reported to VAERS, even if causal relation to vaccination is not certain. VAERS reporting forms and information are available electronically at http://www.vaers.hhs.gov/ or by telephone, (800) 822-7967. Web-based reporting is available and providers are encouraged to report electronically at https://secure.vaers.org/VaersDataEntryintro.htm to promote better timeliness and quality of safety data.

Safety surveillance for adolescent Tdap, MCV4, and other vaccines is being conducted on an ongoing basis in cooperation with FDA. Previously published safety data for Td and for tetravalent meningococcal polyscaccharide vaccine will provide some of the basis for comparison with postlicensure safety surveillance for Tdap and MCV4, respectively (Bilukha & Rosenstein, 2005; Ball, Braun, & Mootrey, 2001).

Vaccine Injury Compensation

For full details refer to the original guideline document.

CLINICAL ALGORITHM(S)

None provided

EVIDENCE SUPPORTING THE RECOMMENDATIONS

REFERENCES SUPPORTING THE RECOMMENDATIONS

References open in a new window

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

Summary of evidence for routine adolescent tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis vaccination*

1-A:1 Efficacy against and tetanus, diphtheria, and pertussis is supported by immunogenicity results of randomized, controlled clinical trials among adolescents; safety is supported by results of randomized, controlled clinical trials among adolescents.

1-A:2 Safety of an interval of at least 5 years between tetanus and diphtheria toxoids vaccine (Td) and Tdap is supported by randomized, controlled clinical trials, among adolescents.

1-A:3 Safety of simultaneous vaccination with Tdap and tetravalent meningococcal conjugate vaccine (MCV4) has not been directly studied, but is inferred from results of a randomized, controlled clinical trial among adolescents vaccinated with Td and MCV4.

* For details, see the following sections in the original guideline document: "BOOSTRIX", "ADACEL", and "Safety Considerations for Adolescent Vaccination with Tdap or Td". Bold number/letter combinations refer to sections from the guideline.

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

Reduction of morbidity in adolescents associated with tetanus, diphtheria, and pertussis

POTENTIAL HARMS

See the "Major Recommendations" field for potential harms.

CONTRAINDICATIONS

CONTRAINDICATIONS

See the "Major Recommendations" field for contraindications.

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

This report will not include any discussion of the unlabeled use of a product or a product under investigational use with the exception of the discussion of off-label use of tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis vaccine (Tdap) by all in the following situations:

A. The interval between pediatric diphtheria and tetanus toxoids and whole cell pertussis vaccine/diphtheria and tetanus toxoids and acellular pertussis vaccine/diphtheria and tetanus toxoids vaccine (DTP/DTaP/DT) or adult

tetanus and diphtheria toxoids vaccine (Td) and Tdap might be shorter than the 5 years indicated in the package insert.

B. Progressive neurologic disorders and uncontrolled epilepsy are considered precautions and not contraindications as indicated in the package insert.
C. Tdap might be used as part of the primary series for tetanus and diphtheria.
D. Inadvertent administration of Tdap and pediatric DTaP is discussed.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

IMPLEMENTATION TOOLS

Staff Training/Competency Material

For information about availability, see the "Availability of Companion Documents" and "Patient Resources" fields below.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Staying Healthy

IOM DOMAIN

Effectiveness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

Broder KR, Cortese MM, Iskander JK, Kretsinger K, Slade BA, Brown KH, Mijalski CM, Tiwari T, Weston EJ, Cohn AC, Srivastava PU, Moran JS, Schwartz B, Murphy TV. Preventing tetanus, diphtheria, and pertussis among adolescents: use of tetanus toxoid, reduced diphtheria toxoid and acellular pertussis vaccines recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR Recomm Rep 2006 Mar 24;55(RR-3):1-34. PubMed

ADAPTATION

Not applicable: The guideline was not adapted from another source.

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FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

CDC, our planners, and our content experts wish to disclose they have no financial interests or other relationships with the manufacturers of commercial products, suppliers of commercial services, or commercial supporters.

GUIDELINE STATUS

This is the current release of the guideline.

GUIDELINE AVAILABILITY

Electronic copies: Available from the Centers for Disease Control and Prevention (CDC) Web site:

- HTML Format
- Portable Document Format (PDF)

Print copies: Available from the Centers for Disease Control and Prevention, MMWR, Atlanta, GA 30333. Additional copies can be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402-9325; (202) 783-3238.

AVAILABILITY OF COMPANION DOCUMENTS

The following is available:

- Preventing tetanus, diphtheria, and pertussis among adolescents: use of tetanus toxoid, reduced diphtheria toxoid and acellular pertussis vaccines. Continuing education activity.

Electronic copies: Available from the Centers for Disease Control and Prevention (CDC) Web site.

PATIENT RESOURCES

None available

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